

edge of the carcass ply starting from a zero value close to transition regions between the side portions and the crown portions.

58. (new) The method of claim 56, wherein the strip sections are laid down by making the side portions of each strip section project from an inner circumferential edge of the toroidal support, projecting ends of the side portions defining the end flaps of the carcass ply.

REMARKS


Applicant submits this Preliminary Amendment together with a continuation application under 37 C.F.R. § 1.53(b). Claims 1-58 are pending in this application.

In this Amendment, Applicant adds section headings, section subheadings, and an Abstract of the Disclosure to conform to U.S. practice. Additionally, Applicant amends claims 1-29, which include the same subject matter as the original claims, to improve clarity. Further, Applicant adds new claims 30-58. The originally-filed specification, claims, abstract, and drawings fully support the amendments to the specification and claims, and the added claims. No new matter was introduced.

If there is any fee due in connection with the filing of this Preliminary Amendment, please charge the fee to our Deposit Account No. 06-0916.

Respectfully submitted,

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Dated: April 27, 2001

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ABSTRACT OF THE DISCLOSURE

A carcass structure for a vehicle wheel tyre includes at least one carcass ply comprising thread elements substantially disposed transversely of a circumferential extension of the carcass structure, and at least one pair of annular reinforcing structures disposed close to respective inner circumferential edges of the at least one carcass ply. Each of the annular reinforcing structures includes at least one first circumferentially-inextensible annular insert formed of at least one first elongated element extending in concentric coils, and at least one second circumferentially-inextensible annular insert formed of at least one second elongated element extending in concentric coils. The at least one carcass ply has end flaps each turned back around an inner circumferential edge of a respective first annular insert and each axially interposed between respective first and second annular inserts. A method of manufacturing the carcass structure is also disclosed.

APPENDIX TO PRELIMINARY AMENDMENT DATED APRIL 27, 2001

Amendments to the Claims

Please amend claims 1-29, as follows:

1. (once amended) A carcass structure for a vehicle wheel tyre[s], comprising:

[-] at least one carcass ply [(3)] comprising thread[-like] elements [(14)] substantially disposed transversely of a circumferential extension of the carcass structure [(2)]; and

[-] at least one pair of annular reinforcing structures [(4)] disposed close to respective inner circumferential edges of the at least one carcass ply [(3)], each of [said] the annular reinforcing structures [(4)] comprising:

[-] at least one first circumferentially-inextensible annular insert [(26)] substantially in [the] a form of a crown disposed substantially coaxially of the carcass structure [(2)], close to an inner circumferential edge of the at least one carcass ply [(3)], [said] the at least one first annular insert [(26)] being formed of at least one first elongated element extending in concentric coils [(26a, 26b)]; and

[-] at least one second circumferentially-inextensible annular insert [(30)] substantially in [the] a form of a crown disposed coaxially of the tyre, [said] the at least one second annular insert [(30)] being formed of at least one second elongated element extending in concentric coils [(30a)],

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[characterized in that said] wherein the at least one carcass ply [(3)] has end flaps [(25a)] each turned back around an inner circumferential edge of [the] a respective first annular insert [(26)] and each axially interposed between [the] respective first and second annular inserts [(26, 30)],

the at least one carcass ply and each first annular insert abutting against each other along either a whole surface extension of the at least one first annular insert or a whole radial extension of the end flaps.

2. (once amended) [A] The carcass structure [as claimed in] of claim 1, further comprising at least one filling body [(31)] of elastomer material in contact with at least one of [said] the [inextensible] annular inserts [(26, 30)].

3. (once amended) [A] The carcass structure [as claimed in] of claim 2, wherein the at least one second [inextensible] annular insert [(30)] is interposed between [the] a respective end flap [(25a)] and the at least one filling body [(31)], [said] the at least one second [inextensible] annular insert [(30)] being in contact with [the] an end flap [(25a)] on [the] an opposite side relative to the at least one first [inextensible] annular insert [(26)].

4. (once amended) [A] The carcass structure [as claimed in] of claim 1, wherein [the] a respective end flap [(25a)] of the at least one carcass ply [(3)] completely covers [the] a respective first [inextensible] annular insert [(26)].

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5. (once amended) [A] The carcass structure [as claimed in] of claim 1, wherein the at least one second [inextensible] annular insert [(30)] projects beyond one end region of [the] a respective end flap [(25a)].

6. (once amended) [A] The carcass structure [as claimed in] of claim 1, wherein each second [inextensible] annular insert [(30)] projects beyond an outer circumferential edge of the at least one first [inextensible] annular insert [(26)].

7. (once amended) [A] The carcass structure [as claimed in] of claim 1, wherein the at least one first [inextensible] annular insert [(26)] comprises at least one first series of concentric coaxial coils [(26a)] and at least one second series of concentric coaxial coils [(26b)] disposed in axial side-by-side relationship with the coils [(26a)] of the at least one first series.

8. (once amended) [A] The carcass structure [as claimed in] of claim 7, wherein [the] a number of coils [(26a)] of the at least one first series is greater than [the] a number of coils [(26b)] of the at least one second series.

9. (once amended) [A] The carcass structure [as claimed in] of claim 8, wherein [said] the at least one first coil series [(26a)] is directly in contact with the at least one carcass ply [(3)], whereas the at least one second coil series [(26b)] is directly in contact with [the] a respective end flap.

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10. (once amended) [A] The carcass structure [as claimed in] of claim 1, wherein the at least one first [inextensible] annular insert [(26)] projects beyond one end region of [the] a respective end flap [(25a)].

11. (once amended) [A] The carcass structure [as claimed in] of claim 1, wherein the at least one first [inextensible] annular insert [(26)] projects beyond an outer circumferential edge of [the] a respective second [inextensible] annular insert [(30)].

12. (once amended) [A] The carcass structure [as claimed in] of claim 2, wherein the at least one filling body [(31)] is interposed between [the] a respective end flap [(25a)] of the at least one carcass ply [(3)] and [the] a respective second annular insert [(30)].

13. (once amended) [A] The carcass structure [as claimed in] of claim 12, wherein the at least one second annular insert [(30)] is directly in contact with at least one axially outer side surface of [the] a respective filling body [(31)], located on [the] an opposite side relative to [the] an end flap [(25a)] of the at least one carcass ply [(3)].

14. (once amended) [A] The carcass structure [as claimed in claim 1] of claim 2, wherein the at least one filling body [(31)] has a circumferentially outer portion directly in contact with a side surface of the at least one carcass ply [(3)].

15. (once amended) [A] The carcass structure [as claimed in] of claim 1, wherein [said] the at least one carcass ply [(3)] comprises:

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[-] a plurality of strip[-like] sections [(13)] each comprising at least two of [said] the thread[-like] elements [(14)] disposed longitudinally and [parallelly of] parallel to each other and at least partly covered with at least one layer of raw elastomer material [(17)],

[-] each of [said] the strip[-like] sections [(13)] extending in a substantially U-shaped configuration according to a cross section outline of the carcass structure [(2)], to define two side portions [(25)] substantially extending in planes orthogonal to a geometric axis of the carcass structure [itself] at mutually spaced apart positions in an axial direction, and a crown portion [(24)] extending at a radially outer position between the side portions [(25)];

[- said] the crown portions [(24)] being disposed in side-by-side relationship with each other along the circumferential extension of the carcass structure [(2)], whereas the side portions [(25)] of each strip[-like] section [(13)] are each partly covered with a side portion [(25)] of at least one adjoining strip[-like] section [(13)].

16. (once amended) [A] The carcass structure [as claimed in] of claim 15, wherein the side portions [(25)] of [said] the strip[-like] sections [(13)] mutually converge towards the geometric axis of the carcass structure [(2)], [the] covering of the side portions [(25)] of the strip[-like] sections [(13)] progressively increasing in [the] a direction of the inner circumferential edge of the at least one carcass ply [(3)], starting from a zero value close to transition regions between [said] the side portions [(25)] and [said] the crown portions [(24)].

17. (once amended) A method of manufacturing a carcass structure for vehicle wheel tyres, comprising the steps of:

[-] making a carcass ply [(3)] having a pair of end flaps [(25a)] disposed circumferentially internally;

forming at least one annular reinforcing structure; and

[-] applying the at least one annular reinforcing structure [(4)] close to each end flap [(25a)] of the carcass ply [(3)];

[characterized in that] wherein the step of forming the at least one [each] annular reinforcing structure [(4)] is formed by the following steps] comprises:

[-] applying at least one first circumferentially-inextensible annular insert [(26)] close to [the] a respective end flap [(25a)] of the carcass ply [(3)], [said] the at least one first [inextensible] annular insert [(26)] being formed of at least one first elongated element disposed in concentric coils [(26a, 26b)];

[-] turning back [the] a respective end flap [(25a)] of the carcass ply [(3)] around an inner circumferential edge of the at least one first annular insert [(26)], causing the carcass ply and at least one first annular insert to be applied against each other according to either a whole surface extension of the at least one first annular insert or a whole radial extension of the end flap; and

[-] applying at least one second circumferentially-inextensible annular insert [(30)] close to the at least one first annular insert [(26)], [said] the second [inextensible] annular insert [(30)] being formed of at least one second elongated element disposed in concentric coils [(30a)].

18. (once amended) [A] The method [as claimed in] of claim 17, further comprising the step of applying at least one filling body [(31)] of elastomer material in contact with at least one of [said] the annular inserts [(26, 30)].

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19. (once amended) [A] The method [as claimed in] of claim 17, wherein at least one of [said] the first and second [inextensible] annular inserts [(26, 30)] is formed by winding up a continuous elongated element in radially-superposed concentric coils [(26a, 26b, 30a)].

20. (once amended) [A] The method [as claimed in] of claim 17, wherein at least one of [said] the first and second [inextensible] annular inserts [(26, 30)] is formed directly against the carcass ply [(3)].

21. (once amended) [A] The method [as claimed in] of claim 17, wherein at least one of [said] the first and second annular inserts [(26, 30)] is formed in a forming die [(27)], [said] the forming die [(27)] being subsequently moved against the carcass ply [(3)] for application of the at least one of the first and second [inextensible] annular inserts [(26, 30)].

22. (once amended) [A] The method [as claimed in] of claim 17, wherein [said] the turning-back of the respective end flap [(25a)] comprises the following steps:

[-] axially pushing the end flap [(25a)] for moving [it] the end flap from a first position [in which it] wherein the end flap projects radially inwardly relative to the at least one first [inextensible] annular insert [(26)] to a second position [in which it] wherein the end flap is axially oriented away from an equatorial plane of the carcass structure; and

[-] exerting a rolling action on the end flap [(25a)] for laterally applying [it] the end flap against the at least one first [inextensible] annular insert [(26)].

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23. (once amended) [A] The method [as claimed in] of claim 18, wherein application of the at least one filling body [(31)] comprises the steps of:

[-] making [said] the at least one filling body [(31)] in a forming die [(32)]; and

[-] axially moving the forming die [(32)] against the carcass structure [(2)].

24. (once amended) [A] The method [as claimed in] of claim 23, further comprising a step of coupling the at least one filling body [(31)] with the at least one second [inextensible] annular insert [(30)] in the forming die [(32)], before [the] simultaneous application of the at least one filling body [(31)] and the at least one second [inextensible] annular insert [(30)] against the carcass structure [(2)].

25. (once amended) [A] The method [as claimed in] of claim 17, wherein application of the at least one filling body [(31)] is carried out by forming the at least one filling body [(31)] directly against the carcass structure [(2)].

26. (once amended) [A] The method [as claimed in] of claim 25, wherein [said] the [formation] forming of the at least one filling body [(31)] against the carcass structure [(2)] takes place by extrusion of at least one continuous strip[-like] element wound up in superposed coils.

27. (once amended) [A] The method [as claimed in] of claim 17, wherein manufacturing of the carcass ply [(3)] comprises the following steps:

[-] preparing strip[-like] sections [(13)] each comprising longitudinal and parallel thread[-like] elements [(14)] at least partly coated with one layer of raw elastomer material [(17)]; and

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[-] depositing each of the strip[-like] sections [(13)] onto a toroidal support [(11)] in a substantially U-shaped conformation around [the] a cross section outline of the toroidal support, to define two side portions [(25)] substantially extending in planes orthogonal to a geometric axis of rotation of the toroidal support [(11)] at mutually spaced apart positions in an axial direction, and a crown portion [(24)] extending at a radially outer position between the side portions [(25)];₂

[- in which] wherein the crown portions [(24)] of each strip[-like] section [(13)] are consecutively disposed in side-by-side relationship along [the] a circumferential extension of the toroidal support [(11)], whereas the side portions [(25)] of each strip[-like] section [(13)] are each partly covered with a side portion [(25)] of at least one circumferentially consecutive section.

28. (once amended) [A] The method [as claimed in] of claim 27, wherein the side portions [(25)] belonging to circumferentially contiguous strip[-like] sections [(13)] on the toroidal support [(11)] are caused to mutually converge in [the] a direction of the geometric rotation axis of the toroidal support [itself], [the] covering of the side portions [(25)] of each strip[-like] section [(13)] progressively increasing in [the] a direction of [the] an inner circumferential edge of the carcass ply [(3)] starting from a zero value close to transition regions between [said] the side portions [(25)] and [said] the crown portions [(24)].

29. (once amended) [A] The method [as claimed in] of claim 27, wherein the strip[-like] sections [(13)] are laid down by making the side portions [(25)] of each strip[-like] section [(13)]

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project from an inner circumferential edge [(11a)] of the toroidal support [(11)], [the] projecting ends of the side portions defining the end flaps [(25a)] of [said] the carcass ply [(3)].

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